

PATENT SPECIFICATION

Convention Date (United States of America): Feb. 10, 1940. 579.071

Application Date (in United Kingdom): Feb. 12, 1941. No. 1915/41.

Complete Specification Accepted: July 23, 1946.

(Under Section 91, sub-sections (2) and (4) of the Patents and Designs Acts, 1907 to 1942, a single Complete Specification was left in respect of this Application and of Applications Nos. 1914/41 and was laid open to inspection on Aug. 11, 1941).



COMPLETE SPECIFICATION

Refrigerator

I, GUYON LOCKE CROCHERON EARLE, a Citizen of the United States of America, of 37, Greenway South, Forest Hills, New York, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

10 This application relates to refrigerators and more specifically but not necessarily to refrigerators adapted to be built into kitchens and to methods of assembling them.

15 It is an object of this invention to provide improved methods for assembling and an improved construction of a mechanical refrigerator unit.

20 In United States patents 2,180,460 issued November 21, 1939 to Guyon L. C. Earle and 2,312,325 issued on March 2, 1943 to the same inventor, there are disclosed mechanical refrigerators of the "set-back" type, that is, refrigerators of the type having a relatively large bottom portion adapted to be refrigerated, a smaller upper refrigerated portion the front of which is set back from the front of the bottom portion, and a table top member located above the bottom portion and in front of the top portion. The present invention provides methods of mounting the cooling units in refrigerators of this type during the assembling process.

35 According to the present invention a mechanical refrigerator includes a relatively deep lower portion having an opening in the upper part thereof, a relatively narrow upper portion having an opening in the lower part thereof of substantially the same size as, and coinciding with, the opening in said lower portion, and a sealed refrigerating unit including an evaporator unit, a liquefying unit and tubes for the flow of refrigerant between these units, said evaporator unit being secured within said upper portion and said liquefying unit being positioned outside of both said portions said tubes pass-

ing out of the assembled upper and lower portions at the junction therebetween. Preferably the refrigerator is positioned so that at least the rear part of the upper portion projects back into the wall of the room containing the refrigerator.

The invention also includes a method of assembling the refrigerator which method comprises placing and securing within the upper portion the evaporator unit positioning the liquefying unit outside of both of said portions of the refrigerator, placing the upper portion on the lower portion in such a way that the two openings coincide and the tubes pass through the junction between said two portions and securing said upper portion to said lower portion.

As briefly mentioned above, the method in accordance with this invention is particularly suitable for assembling refrigerators of the "set back" type. Such a refrigerator, by way of example, comprises upper and lower portions arranged together so that the front wall of the upper portion is set back from and is preferably parallel to the bottom front wall. A table top member is mounted on top of that part of the bottom portion of the refrigerator not covered by the top portion thereof. The upper compartment contains the cooling unit and, within the coils thereof, a plurality of ice cube trays which may be placed behind an inner door. This compartment also contains racks for small articles such as eggs, cheese, etc. Above the top portion of the refrigerator itself is a cabinet the front of which preferably projects beyond the front of the upper portion of the refrigerator but which is set back from the front of the lower portion thereof. In the bottom of the refrigerator is a large and deep refrigerated space which is preferably closed by a number of sliding closure members such as drawers and the like. The entire refrigerator unit is preferably mounted on a recessed base.

In assembling the above described unit,

[Price 1/-]

the lower portion is made up and mounted on the recessed base. The cooling unit is then placed in the upper portion and fastened therein. The upper member is then mounted on the lower member, being separated therefrom by a gasket or gaskets, and is preferably fastened to the lower member by any suitable means. The tubes leading to the cooling unit from the liquefying unit are brought out through a side or rear gasket without breaking the connection between the liquefying and evaporating units. The table top member, if it is other than the finished top of the bottom portion of the refrigerator, is then mounted on top of the bottom portion and in front of the upper portion.

The invention will be more readily understood by referring to the following description and the accompanying drawings forming a part thereof, in which:

Fig. 1 is a front perspective view of a refrigerator assembled in accordance with this invention;

Fig. 2 is a cross-sectional elevation view of the refrigerator of Fig. 1; and

Fig. 3 is an elevation view, with portions broken away, of a combined refrigerator and sink unit showing the liquefying unit of the refrigerator under the sink.

Referring more particularly to the drawings, Fig. 1 shows, by way of example, a refrigerator 10 assembled in accordance with the invention. This refrigerator is of the "set-back" type because the front surface of the upper portion 13 thereof is set back from the front surface of the lower portion 12 thereof. The refrigerator rests on a base member 11 which is set in or recessed to provide toe room for the user. Above the upper portion 13 may be placed, if desired, a cabinet section 14. A table top member 15 covers that portion of the lower refrigerated portion 12 which is in front of the upper portion 13. The refrigerator 10 is particularly adapted to be used in a kitchen unit which also includes a stove, a sink, a dish drainer and cabinets, an extension of the table top member 15 serving as a drain board for the sink. By way of example, a sink 65 can be positioned at the right of the refrigerator, as indicated in Fig. 3.

The lower portion 12 of the refrigerator comprises side walls 16 and 17, a back wall 18, and a front wall 19 which is broken up to provide mullions 20 for a plurality of drawers 21, 22, 23 and 24, the lower one of which can be higher and deeper than the others so as to accommodate a large number of bottles, a large roast, etc. The upper portion 13 of the

refrigerator comprises an evaporator compartment 25 and an upper refrigerated compartment 26 at the side thereof. The compartments 25 and 26 are closed by doors 27 and 28 respectively.

The upper and lower portions of the refrigerator are made as separate entities and can be connected together at the final assembly point, such as in the kitchen, employing in the process a suitable gasket or gaskets 31, the connections or pipes 32 from the evaporator coils 33 preferably passing out the side of the refrigerator (as shown in Fig. 3) through the gasket 31, although in some arrangements these connections may pass out through the rear of the refrigerator (as shown in Fig. 2). The liquefying unit 66 of the refrigerator is preferably located under the sink 65 of the unit shown in Fig. 3.

Located within the evaporator coils 33 are a plurality of ice cube trays 34 to 36 inclusive, the lower tray 36 preferably being larger than the others. The evaporator is placed snugly within the frame to eliminate the necessity for an inner door but with enough space to prevent the door 27 from being frozen shut. There is preferably space at the side and back for better circulation of cold air around the evaporator and through the ice tray compartments. Beneath the coils 33 may be removably arranged one or more deflecting members 40 which may be used to "spill" part of the cold air from the evaporator 33 into the top drawer and thence to the upper front and middle front portions of the refrigerator. A container 41 can be placed in the upper drawer to catch drip water. The front portion of the refrigerator really needs more cold air than the rear because the circulation is slower and the rear is built-in and not so exposed to room temperature, but a more rapid circulation necessary for the efficiency of the evaporator is caused to take place in the rear—behind or through the open rear portions of the drawers. One or more layers of insulation in the walls of the back, top and bottom of the refrigerator and for the drawer fronts may be provided and similar layers of insulation (not shown) provided for the sides.

Above the upper refrigerated portion 13 of the refrigerator there is provided a cabinet member 14 equipped with a number of shelves 50 and closed by doors 51 and 52. A molding or boxed-down ceiling 53 is located above the cabinet section.

In Figs. 2 and 3, part or all of the refrigerator is shown set back into the wall 120 of the room, the tube connections 32 from the evaporator 33 being

brought out at the rear (or if desired, the side) of the unit through the gasket 31. These tube connections are connected to the compressor 66 shown in Fig. 3.

5 It is a feature of this invention that the upper portion 13 is made into a unit and the lower portion 12 is made into a second unit. Then the evaporator is placed inside and fastened within the
10 upper portion 13 and the upper portion 13 mounted on and fastened to the lower portion 12. This permits the refrigerator to be finally assembled, as at the place where it is to be used, without disconnecting the compressor from the evaporator
15 and also does away with the usual large insulated gaskets usually found in most hermetically sealed boxes. It also makes it possible to install an evaporator larger than the distance between adjacent
20 drawers after the lower portion 12 has been completely made because the evaporator does not have to be inserted into the refrigerator through the openings for the drawers as it would have to be were the bottom and upper portions
25 made as a single unit. Even more important, it makes it possible to take the evaporator 33 out of the refrigerator (or if desired, the entire upper portion
30 13) without sending the whole refrigerator back to the factory in the situation where the refrigerating unit is a completely factory sealed unit and something goes
35 wrong with it.

Reference will now be made to Fig. 3 which illustrates more clearly the method of assembling a sealed refrigerating unit in a refrigerator of the type having an
40 upper "set-back" portion. This figure is a side elevation view, with portions broken away, of a refrigerator and sink unit taken from the right side of the unit. Parts of the side walls 130 and 131 of
45 the upper and lower portions of the sink unit and of the wall 132 between the upper portions of the sink and refrigerator units, respectively, have been broken away to show the evaporator unit 33 in
50 the upper portion of the refrigerator unit, the liquefying unit 66 down below, tubes 32 between the evaporator and liquefying units, which tubes pass through gasket 31 between the upper and
55 lower portions of the refrigerator unit, and the sink 65 with a portion of its associated plumbing. During the assembly process, which, in the case of large units, preferably takes place in the
60 kitchen, the lower cabinet portions of the refrigerator and sink units are first placed in position (if desired, with the rear of the lower portion of the refrigerator unit, or both refrigerator
65 and sink units, projecting back into the

wall of the room to save space in the room). The evaporator 33 is then placed within and secured in its proper position within the upper portion of the refrigerator unit (the tubes 32 not being
70 disassembled during this step, nor, for that matter during the entire process of assembling). The upper portion of the refrigerator is next mounted on the lower portion thereof (preferably with
75 the rear portion of the upper portion also projecting back into the wall of the room), the tubes 32 passing from the inside to the outside of the refrigerator through the gasket 31 which is placed
80 between the two portions thereof. The liquefying unit 66 is then secured in the bottom of the cabinet of the sink unit. The table top 15 and the sink 65 may then be put in position and fastened, and the
85 plumbing for the sink 65 connected. Obviously, the gasket 31 may be of one piece and form a part of the apparatus accompanying the sealed refrigerating unit or be made of several pieces and put
90 together in the kitchen. In this latter situation, packing material may be desirable around the holes through which the tubes 32 pass. It is obvious that the order of performing certain of steps
95 given above may be varied. By means of this method of assembly, the services of a skilled refrigerator installation mechanic are not necessary as any person capable of installing the cabinets is
100 capable of installing the refrigerator.

In the claims, the terms "deep" and "narrow" have reference to the horizontal dimension at right angles to the
105 front planes of the unit.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A mechanical refrigerator including
110 a relatively deep lower portion having an opening in the upper part thereof, a relatively narrow upper portion having an opening in the lower part thereof of substantially the same size as and coinciding with the opening in said lower portion, and a sealed refrigerating unit including
115 an evaporator unit, a liquefying unit and tubes for the flow of refrigerant between these units said evaporator unit being secured within said upper portion, and said liquefying unit being positioned
120 outside of both said portions said tubes passing out of the assembled upper and lower portions at the junction therebetween.
125

2. A mechanical refrigerator as claimed in claim 1, wherein the refrigerator is positioned so that at least
130

the rear part of the upper portion projects back into the wall of the room containing the refrigerator.

3. A method of assembling the
5 refrigerator claimed in claim 1 or claim 2 comprising placing and securing the evaporator unit within the upper portion, positioning the liquefying unit exteriorly to both of said portions of the
10 refrigerator, placing the upper portion on the lower portion in such a way that the two openings coincide and the tubes pass through the junction between the said two portions and securing said
15 upper portion to said lower portion.

4. A refrigerator substantially as

described with reference to Figures 1 and 2 of the accompanying drawings.

5. The method of assembling a refrigerator as claimed in any of claims 20 1, 2 or 4 substantially as described with reference to Figures 1 and 2 of the accompanying drawings.

6. Refrigerators whenever assembled in accordance with the method claimed 25 in claim 3 or claim 5.

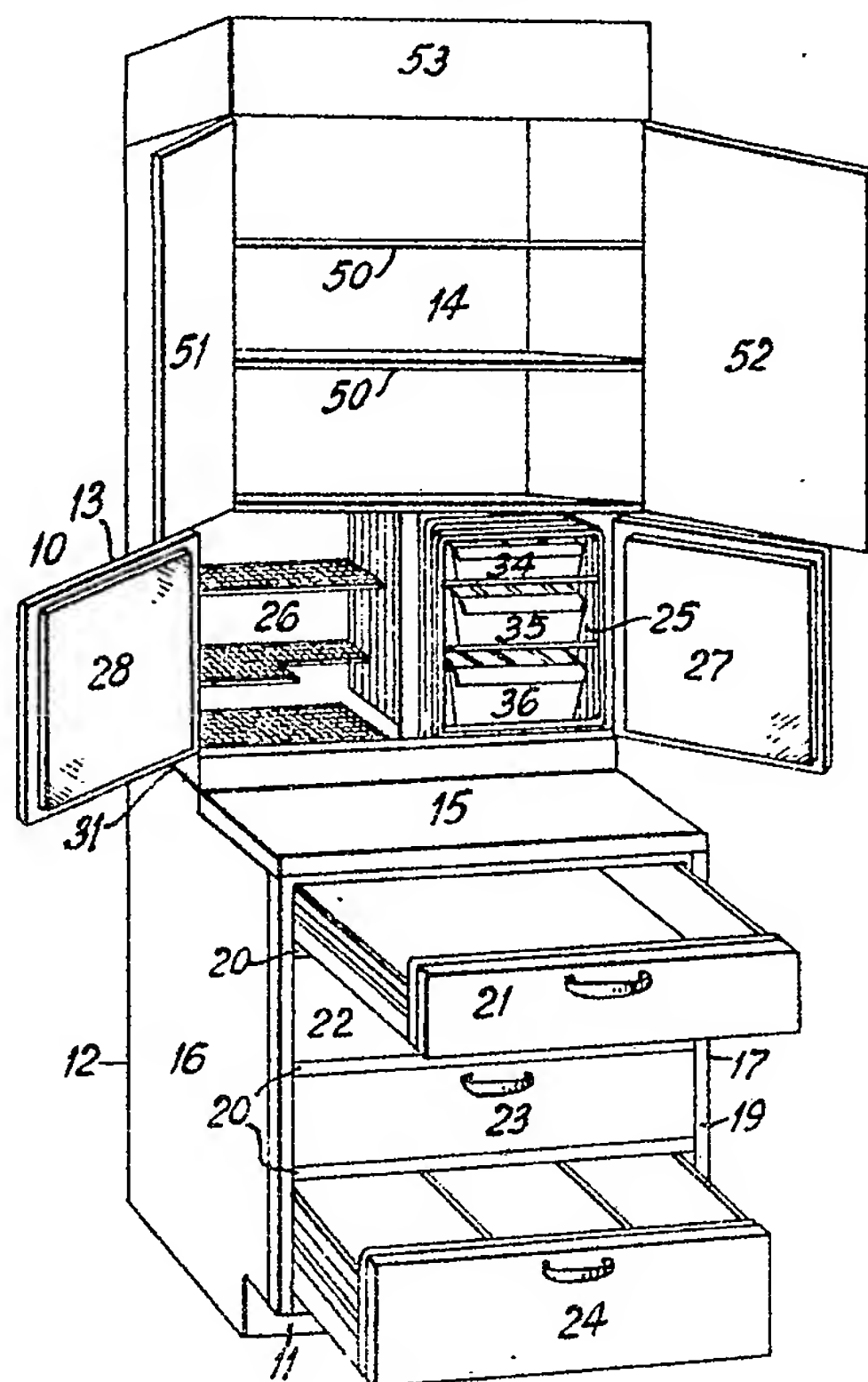
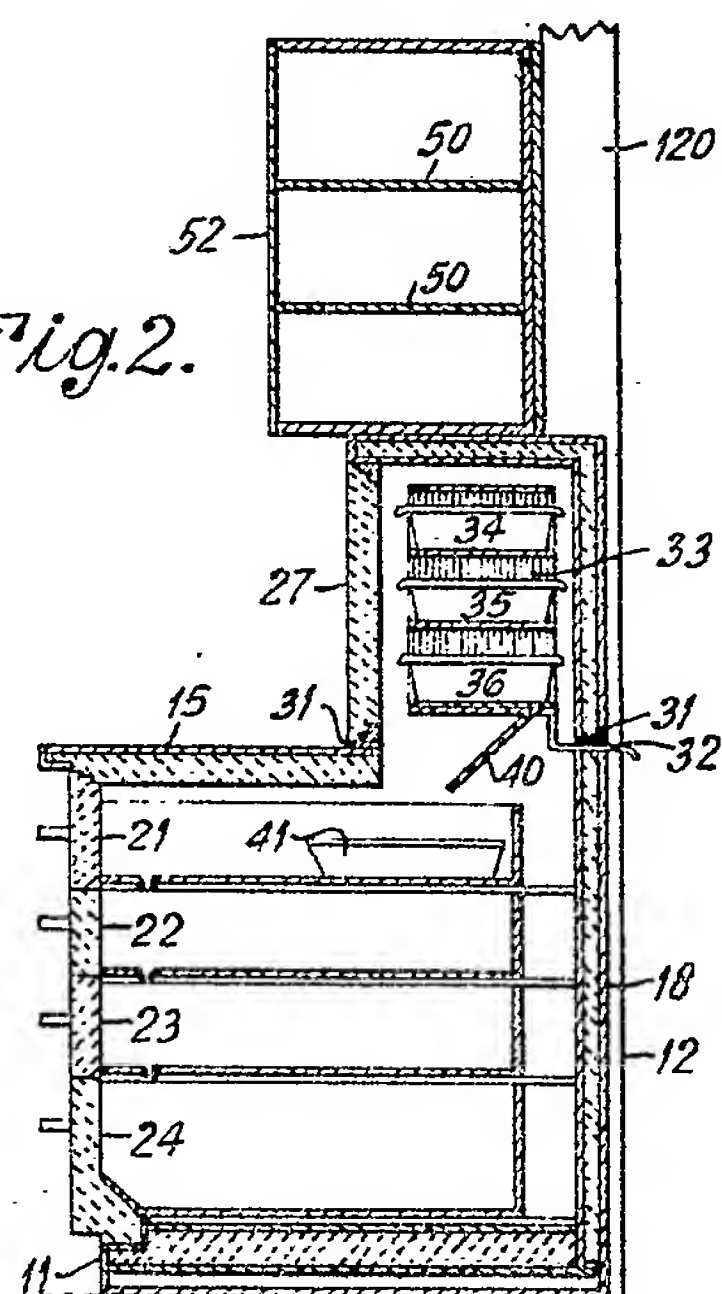
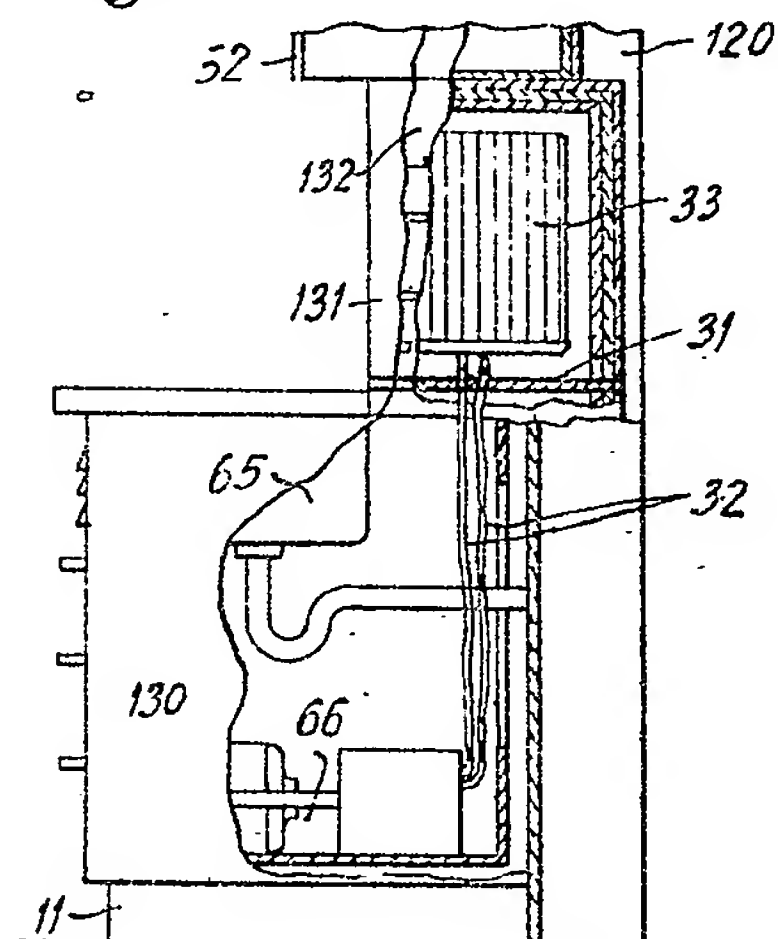
Dated this 17th day of October, 1945.

HUGHES & YOUNG,

Agents for the Applicant.

7, Stone Buildings, Lincoln's Inn,
London, W.C.2.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1946. Published at
The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies,
price 1s. 0d. each (inland) 1s. 1d. (abroad) may be obtained.

Fig. 1.*Fig. 2.**Fig. 3.*

This Drawing is a reproduction of the Original on a reduced scale.